



The Repair and Maintenance Of Earth Constructed Roads

Bulletin by U. S. Bureau of Good Roads.

IF YOU look at the ordinary country road after a shower you will see small puddles along the wheel ruts and sometimes larger pools. This water stays on the road surface because it cannot drain away into the side ditches. If you look closely you will see side ditches which have grown up with bushes and weeds in many cases, and which are so far from the traveled part of the road that the rain water does not drain into them. To prevent water from standing on the traveled way the road should be raised in the center and should slope gently into broad, shallow ditches. It is then said to have a crown.

The Proper Slope.

If it is 10 feet from the center of the road to the side ditch, the surface of the side ditch should be at least 10 inches lower than it is at the center where the horses travel. The road then has a 10 inch crown. The rain then falls on a road properly crowned will run quickly to the side and not soak into the surface or form pools. The side ditches for the surface water should run parallel to the right of way, and should be open at every low point so that the water can run out of them into neighboring brooks or streams. If the ditches merely collect the water from the road surface and it can not run away, large pools will be formed along the roadside, which will gradually sink into the soil beneath the road and make it so soft that the wheels of wagons will cut through the road surface and soon destroy it.

Draining the Road.

Sometimes water runs from land along the road into the road and forms a little stream down the wheel track, or in the middle where the horses travel. When driveways into farm yards are built across the side ditches they frequently form channels for water from the farm yard to run into the road. The pipes under driveways become filled with leaves or rubbish

and the water can no longer run away. If the driveways that stop the ditch water were rebuilt so that no pipes were necessary and the ditch could be left open, much trouble from surface water would be stopped.

The Spill Log Drag.

To keep a road smooth and crowned the best method is to drag it with a road drag. A road drag is made easily with two halves of a log which has been split. The log should be about six or eight inches in thickness and about six or eight feet long. The two halves of the log are cut apart with the smooth faces toward and upright. They are then fastened together with braces set in holes bored through the log. A pair of horses may be used to drag the road and are hitched to a chain fastened to the front half of the log. The road drag should move forward so that it slants across the road in such a way that a small amount of the road is always dragged out the rear. The best way to drag is to begin at the side ditch and go on one side of the road, and then drag the other.

In the next trip the drag should be started a little nearer the center and the last trip over the road the drag may work close to the center itself. Small ridges of earth will be thrown in the horse track and smoothed by the round side of the log smoothly over the road. The smoothing of the earth by the drag is called puddling and it tends to make the surface of the road smooth and water-tight after the sun comes out.

After the road has been puddled it is good, and not when it is dry. A good, straight pair of horses with a well built driver can drag about three or four miles of road in a day, and it is the best way to maintain good roads. In every county some farmer takes each year a pair of horses and a drag and drags the road when it rains, and he would always find the road in good condition when he goes to market.

SHOULD BE MADE IN EARLY MORNING

Tucson Auto Party Makes
Mammoth Wash Crossing
in 23 Minutes.

Tucson, Ariz., June 28.—All known records were broken for crossing the divided seven miles of the Mammoth Wash, between Yuma, Ariz. and Glamis, Calif., when a Tucson newspaper man, L. J. S. Loeb, and Frank Sutherland, a cattleman, pulled the Wash in Sutherland's Hudson in 23 minutes. Of that time, 20 minutes was the actual running time, and the last three minutes were lost behind a wagon, which was temporarily stuck in the deep sand.

The Mammoth Wash is a part of the Boreland route, and a feasible course to get around it has been possible thus far to find. It is greatly dreaded by motorists. For evidence of motorist's panic are convincing. The day makes the coast, such as Loeb and Sutherland are making, it is advised to make the wash in the very early morning before the heat of the day makes the sand light; to lower the tires to about two-thirds of the regular pressure to wind ropes around the tires, waiting them through the spokes of the wheel so as to help keep the wheels from slipping; and to have a very liberal supply of fuel and lubricants and to pull at a moderate and steady gait.

Loeb and Sutherland, who are now in San Diego, drove an average of 12 hours a day at about 20 miles an hour. They are going as far as San Francisco, and will then retrace their track, making the round trip about 2500 miles.

Make Grand Canyon Tour.

Ed Hartman and Harry John Hildred and party, L. H. Hofmeister and Mrs. Hofmeister, F. Ed Litt and family, and E. C. Spierdier and family are among those which have recently returned from tours to the Grand Canyon by way of Phoenix, Prescott, Ash Fork, and Williams. The trip is more than 1000 miles round-trip. Its worst feature is the dreaded "jarnal hill," just west of Prescott, where motorists get through with but minor trouble with their cars. To show the spread of motorist's love, the Tucson Tucson families have made the Tucson-Grand Canyon run this spring and summer. The trip is a most unthought-of, and was considered the most daring kind of automobile pioneering.

Auto Sales Increase.

Sales of automobiles this season in Tucson are about four times those of any previous year, and are still continuing at the rate of about one a week, mostly in the way of two and four passenger models, with a few of the more expensive types of cars. One important item is the increasing demand on the part of mining companies for motor trucks to haul ore and supplies back to the mines. Half a dozen such trucks have been ordered by the local mining companies. Most of the very expensive types of pleasure cars are bought out of town, and consequently do not figure in the total of local sales.

MOTORCYCLE NOTES

The street cleaning department of the District of Columbia has been so well pleased with the two motorcycles recently purchased, that two additional machines will be installed in the department. One of the machines in this department has made an excellent record for economy. The motorcycle has covered 2,800 miles and has only consumed 25 gallons of gasoline, making over 100 miles to a gallon of gasoline.

Reuben Ginsberg and George Drobinski, of Chicago, will attempt to walk to Seattle, Wash., this summer. If they succeed they will be awarded a motorcycle, on which they expect to make the return trip.

A motorcycle race over the Elgin road course is being planned for July 4. Only 100 entrants will be admitted, and the race will be conducted on practically the same conditions that exist during the Elgin automobile races.

June 1 about 50 members of the Excelsior Motorcycle club of Minneapolis, Minn., made a 120-mile cross country run on their two-wheeled steeds.

On a motorcycle with sidecar attachment Mr. and Mrs. George M. Beckett of Pittsburgh have started on a trip which will include the states of California, Arizona, New Mexico, Texas, Florida, and Alabama.

Members of the Greenville (Ala.) Motorcycle club are planning a trip to Savannah, Ga., at an early date. The distance is 250 miles, and the club members will have covered 200 miles when they arrive home.

It is estimated that there are 500 women motorcyclists in England at present.

Fund du Lac, Wis., Springfield, Mo., and Waupun, Wis., have been added to the list of cities finding motorcycles of great value in police work.

Two girl motorcyclists of Pasadena, Cal., Miss Vella Steele and Mrs. Rutha Wyle, recently broke all former records for riding to the summit of Mount Wilson.

The record of motorcycle officer William J. Lennon, of Grand Rapids, Mich., has proved the two-wheeler not only most efficient in police work, but also very economical. During the three years that Lennon has ridden a motorcycle he has traveled 22,222 miles, making an average of 22,222 miles a year. And a year of motorcycle riding duty in the Grand Rapids department has cost him only \$2.22.

In his three years of service Lennon brought in 400 lawbreakers.

In a motorcycle race recently staged in England between the Oxford and Cambridge varsity teams, the Cambridge riders were winners.

Riding his motorcycle full speed to a place where he had been informed a duel would be fought, officer Wise, of Canton, Ohio, arrived in time to prevent the duel.

Leroy Shodgrass left Los Angeles on May 24 to ride his motorcycle to New York City. Mrs. Shodgrass accompanied him in a sidecar.

Many motorists are planning to ride their motorcycles to Denver to attend the F. A. M. convention July 22-25.

Fifty-four members of the Tacoma and Olympia (Wash.) Motorcycle clubs enjoyed a 188 mile run on May 25.

In less than a year there has been an increase of almost 1000 in the number of motorcycles used in the state of Wisconsin. Up to July 1, 1912, there were 5178 two-wheelers registered in this state, while on June 1, 1913, the number had reached 6178.

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MOTORISTS' PROBLEMS ARE SOLVED HERE

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Who as President of the Stewart Automobile Academy of New York City, is regarded as the leading authority in Motor Car Education in this country.

Tell us your motoring problems and discuss your comments. Correspondence invited for publication every Week-End.

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Mejoring Department, The Herald.—I am having a lot of trouble caused by a defective accelerator. Up to a few days ago a slight touch of the throttle or press of the accelerator pedal would send the car along quickly, but now I can get no response. It is as if the accelerator is not working. The motor seems to lose all its power. By throwing in the clutch with the car coasting, however, the motor immediately sets the motor in action, but only for a few minutes, when the above state is again repeated.—Mallard Hayes.

It seems that the proper amount of gasoline does not reach the carburetor. If dirt or other foreign material gets into the pipe line and partially closes it, the trouble you have named will result. It may be possible that the valve in the pipe leading from the tank may be slightly closed and not permitting enough gasoline to enter the carburetor. In such cases it is of necessity to take the tank in order to remove the dirt from it. Pieces of lint and other foreign matter will get into the tank while the car is being filled, and if the tank is not cleaned out, the gasoline should be strained before it is put into the car. The gasoline should be strained through a fine cloth, and the tank should be cleaned out. This is heavier than gasoline and will not pass through the spray nozzle. As a result the water which is in the tank will be carried into the carburetor. There is usually a drain cock at the bottom of the carburetor, and this should be opened and the water drained out. Since the water is heavier than gasoline it will naturally drain off first.

Mejoring Department, The Herald.—I noticed a small leak in one of the valves of my motor, which was caused by a blowout in the casting. The cooling water, I know, should not be allowed to leak, especially during these hot days, and I would appreciate your suggestion for its repair. Is it necessary to have it welded?—Arthur Street.

If the hole is a very small one it can be repaired by using a cement called "Smooth-on," otherwise would the expensive hole be drilled and plugged. By using lead on the threads of the plug the lead will be forced into the hole and will seal the casting and retouching with cylinder paint the repair will hardly be noticed. If, however, there is a crack extending from the hole, it would be advisable to have same welded, even though it be more expensive.

Mejoring Department, The Herald.—My motor runs very frequently, and low speed, although only one cylinder is affected. I run on a high tension spark, and believe this ignition trouble may be due to the motor possibly to the plugs. How may I be able to determine the cause?—Motorist.

First, determine whether you have equal compression in all the cylinders. If one cylinder has weak compression, this is the cause for the miss. It may be due to a compression leak either at the spark plug, the valve plug or the valves. Usually an unseated exhaust valve will cause a trouble. If your miss is due to a defective spark plug you can easily locate this by short circuiting same with a screwdriver across the top of the plug. If the sound of the motor, if no perceptible change in the firing of the plug, determine which one of the particular plug short circuiting. You can conclude that this is the faulty plug. Oftentimes the miss which you speak of due to a defective plug, a slight air leak at the gasket will cause a miss at low engine speeds and not be perceptible at higher engine speeds. It is hardly possible that the trouble lies in the magnetos except that of due to the secondary circuit. Be defective and short circuiting the current between the magnetos and plug.

Mejoring Department, The Herald.—Would it be better to use the same liquid carbon remover in more than one place? The solution is rather expensive, although effective, and according to directions should remain in the cylinder for a couple of hours. A large quantity is required for each cylinder.—Benny.

No harm can be done by using the same liquid in the other cylinders. It is doubtful, however, whether you will find it practical. The liquid may be removed by means of a suction gun and then transferred to any one of the other cylinders. It may be worth experimenting.

Mejoring Department, The Herald.—Will my magnetos without injury to itself deliver enough amperage to light a car with a 12-volt battery, side lamp, or both? Of course, I understand I shall have to control the voltage to protect the lamp, but if the magnetos will deliver the current the voltage can be handled.—F. D. Moffet.

It is not practical to use such a magnetos for lighting purposes. It is best to use a generator in connection with a storage battery. The magnetos are designed for lighting the car, and could hardly be used for both.

Mejoring Department, The Herald.—The radiator of my car and the water set so hot that I feel the warmth in the front seat. I understand that by putting yourself in the water the trouble in the water the trouble can be eliminated. Will you please advise if this is true?—E. K.

Would suggest that you use a strong solution of alkali in the cooling system in order to remove foreign deposits from the radiator. The alkali deposits form a coating on the radiator surfaces, preventing proper cooling. The solution must be taken not to allow the solution to remain in the cooling system too long. Fifteen or 20 minutes is sufficient. After draining thoroughly the whole system should be thoroughly rinsed to prevent the alkali from injuring the various connections. If you do not care to mix the solution yourself, you can obtain same with directions for use from various supply stores.

Mejoring Department, The Herald.—Using the same amount of acid and under identical conditions, would a car equipped with light, detachable rims be able to attain greater speed and more mileage than a car with heavier, detachable rims? Could any difference be noted with tires which were

one-third lighter than the average pneumatic?—S. G. M.

Weight affects fuel consumption and speed. The heavier the car, the more power it takes to propel same and consequently more fuel. While the increase in weight between different size rims is only slight, nevertheless it must be considered. Under ordinary circumstances one would hardly be able to notice it.

Mejoring Department, The Herald.—There is a continual squeaking under my car which is extremely annoying. I have oiled all the spring shackles and other parts, but the noise is still there. What would you suggest?—S. L. Kennedy.

A noise similar to the one you speak of is often caused by the spring leaves rubbing against each other. I cannot advise that you jack the frame until you are able to insert oil between the leaves. When overhauling the car it is advisable to disassemble the springs, clean each leaf thoroughly, and treat with graphite before putting together again. By doing this you will also add to the riding of the car.

Mejoring Department, The Herald.—I have a leather to metal clutch with grips. Although I am careful about the grinding and placement, I cannot cure the desired result. What may cause this?—H. L. P.

The leather of the clutch is no doubt too dry and should be treated with oil or neatfoot oil. First, clean the clutch leather in order to remove all foreign matter. It is often necessary to remove the glass surface, if any, by scraping. Apply the oil over the whole face of the leather and allow it to soak in overnight. This should eliminate the leather and help to eliminate the trouble. If you have an adjustment on clutch spring would advise decreasing the tension of the spring slightly.

Mejoring Department, The Herald.—Can you tell me why my car does not go to the right whenever I apply the brake? I also notice that the right tire wears out sooner than the left.—Walter.

Your trouble is caused by unbalanced brakes; the brake operating on the right wheel holds better than the brake operating on the left wheel. Both wheels should be raised on jacks and the brake acting rods, etc., adjusted so that when the brake is applied the tension on each will be equal. This will avoid skidding, and also relieve the strain on the right tire.

Mejoring Department, The Herald.—Kindly advise me whether the oil which arrives at the top of the piston works there gradually by the motion of the piston or is drawn there by the suction of the exhaust.—James E. Fallon.

The oil works past the piston rings to the combustion chamber due to suction and compression in the crank case. If too much oil gets into the combustion chamber it does not thoroughly burn, and a smoky exhaust results. The suction of the exhaust, of which you speak, does not draw the oil into the combustion chamber.

Mejoring Department, The Herald.—I have been told that the front wheels run at the same speed while the rear side rear wheel runs slightly slower than the front wheels and the inside wheel still slower than the other three. Is this so?—E. L. S.

If all the wheels and tires are of the same size there is no reason why any wheel should turn faster than any other. The drive wheels may slip at times, due to poor traction, but this is not intended.

It is not good manners to come honking and squeaking up behind a brother motorist who happens to be jogging at the respectable rate of 20 miles per hour, as if you were coming through at 60. Then, when the 20 mile man draws politely aside and lets you pass, to pull over in front of him and drop into a 20 mile jog yourself and give him the benefit of your dust for a mile or two, as a reward for his politeness.

After you have finished blowing up your tire, drop a film of moisture on the valve outlet. If this moisture stays there, obviously the valve is tight, but if it disappears there is a leak. In putting on the valve cap, after it has been screwed tight, loosen it a little and listen to see if there is any leak. If there is, then the cap has pushed the plunger down, and the thing to do is to adjust the washer in the cap, so that it does not touch the plunger, or else get a new cap.

Probably no cure for "furring" of a radiator and connections is better than the simple use of rain water. Such water naturally has no minerals dissolved in it, and consequently will dissolve those which are present in the radiator. The water should be drained off when hot, for it is then that it holds the greatest quantities of soluble salts in suspension.

If a motor persists in missing when only a light load is being carried, before restoring to adjustment of the carburetor, try making spark cap a little wider, presumably, of course, that a magnetos is being used. On the other hand, if the motor misses when there is a heavy load on board, it may possibly gap slightly.

On all cars having a rear axle secured to tapered shafts, care should be taken to see that the hubs are kept wedged up tightly on the taper of the axle shaft by means of their locking nuts. Once a month the

rear hub caps should be taken off and the locking nuts be moved up as snugly as possible without injuring the threads. If this is not done, the hub will work loose on the shaft, and by rubbing against the key will certainly spread the key-way in comparatively short time.

CLEARING UP THE RUNNING BOARDS.

In contrast to the methods in vogue only recently when a motor car owner figured his car more attractive because of profuse equipment scattered along the sides and rear of the machine, au-

tomobile makers are now firm advocates of the "clean up" movement. Several of the larger makers have taken a step in this direction by placing a step in special holders at the rear of the car and by removing the tool box from the running board. With these cars compartments have been constructed in the areas directly alongside the running board for tool carrying purposes. The tool compartments when closed cannot be distinguished at a distance of a few feet from the car, and are in equally accessible place when repairs are needed. This also obviates the necessity for passengers having their seats, as is the case when the tools are kept in compartments under the cushions.

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CONGRESS TAKES UP ROAD WORK

Recognizes Necessity for Federal Aid
for National Highways and Creates
a Committee.

Washington, D. C., June 28.—"Congress has the power to extend national aid to good roads under the interstate commerce clause of the constitution, and the authority to build military highways and to establish post roads. Jefferson thought so, Madison thought so, and so did Calhoun. There is no question about the power of congress in the premises."

So asserted chairman Henry, of the rules committee of the house of representatives recently when he concluded the debate which preceded action that created a committee on public roads—the first time in the existence of congress that the roads question received a recognition which places it among the big subjects now demanding position on national legislative attention.

The Federal aid roads convention in Washington called by the American automobile association, through its resolutions committee last March, asked congress to create a committee to study the roads question, and the others in the list as follows: Edward W. Saunders, Virginia; Henry A. Barnhart, Indiana; James E. Davenport, Oklahoma; James P. Bryson, South Carolina; Hubert D. Stephens, Mississippi; John J. Whitacre, Ohio; Robert L.

Doughton, North Carolina; John B. Connolly, Kansas; Edward Keating, Colorado; Clyde H. Tavenner, Illinois; Peter C. Ten Eyck, New York; James B. Sewell, Louisiana; Francis B. Leavelle, Pennsylvania; C. Bascom Simpson, Virginia; S. F. Prouty, Iowa; Thomas B. Dunn, New York; Howard Sutherland, West Virginia; Milton W. Shreve, Pennsylvania; Edward E. Browne, Wisconsin; Roy A. Woodruff, Michigan.

Of the 21, 15 are new members of the house. The remaining six have given highways some considerable thought, chairman Shackelford undoubtedly leading in his activities.

Byrnes, of South Carolina; Slingo, of Virginia; and Prouty, of Iowa, are well known advocates of federal participation in the road question. Another Virginian, and Whitacre, of Ohio, have evidenced interest in the subject. New York has two members on the committee—Ten Eyck and Dunn; Pennsylvania is similarly favored—Barnhart and Leavelle. Politically there are 10 Democrats, six Republicans and one Progressive, the last being the Michigan representative.

That the good roads subject "has arrived in congress" there can be no doubt. It was a year ago that one of the then senators from Oregon, Jonathan P. Bourn—told his colleagues that the "good roads question was of far greater importance than the tariff and tariff and currency questions combined. The joint committee on federal aid, of which Mr. Bourn is the chairman until it completes its report, has accumulated a vast amount of valuable information, which is now obtainable in printed form upon application at room 130, senate office building, Washington, D. C.

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